Roll No……

GL BAJAJ Institute of Management & Research Greater Noida
FIND YOUR SPARK

Plot No. 2, Knowledge Park-III, Greater Noida (U.P.) –201306

POST GRADUATE DIPLOMA IN MANAGEMENT (2025-27)
END TERM EXAMINATION (TERM -II)

Subject Name: **Production and Operations Management** Time: **02.00 hrs**
Sub. Code: **PG204** Max Marks: **40**

Note: All questions are compulsory. Section A carries 12 marks: 6 questions of 2 marks each, Section B carries 18 marks having 3 questions (with internal choice question in each) of 6 marks each and Section C carries 10 marks one Case Study having 2 questions of 5 marks each.

Kindly write the all the course outcomes as per your TLEP in the box given below:

S. No.	Course Outcomes (COs)	Bloom's Taxonomy Level
CO1	Understand theoretical and conceptual frameworks of Production and operations management for product and services.	Remember- L-1 Understand- L-2
CO2	Learn theoretical knowledge in the key decision-making areas like plant location, layout planning, Inventory and capacity planning, project management for effectiveness in Production and operation management.	Apply- L-3
CO3	Develop critical thinking and skills to design the process for product and services, quality management process and their implementation**.**	Evaluate-L-5.
CO4	Analyses and demonstrate the changes in last decade due to globalization, innovation in technology, automation and digital communication with respect operations and its impact on overall business	Analyze-L-4. Evaluate-L-5
CO5	Apply the content of an operations strategy and the decisions involved into various real-world use cases.	Analyze-L-4 Create- L-6
CO6	Create projects, associated tickets, roles and responsibilities of an operations manager and deal with the corresponding challenges these professionals face on floor.	Create- L-6

SECTION - A

Attempt all questions. All questions are compulsory. **2×6 = 12 Marks**

Questions	CO	Bloom's Level
Q. 1: (A). Define 'Operations Management' and list the '5 Ps' that typically define the scope of an operations manager's responsibilities.	CO1	L1
Q. 1: (B). Briefly explain any two current manufacturing trends in India and their impact on operations.	CO1	L2
Q. 1: (C). Describe how the operational focus changes when a product moves from the 'Growth' stage to the 'Maturity' stage of its Life Cycle.	CO1	L2
Q. 1: (D). Define the 'Funnel Approach' in the context of the New Product Development (NPD) process.	CO2	L2
Q. 1: (E). State the meaning of 'Reverse Engineering' and one common reason why a firm might use it.	CO2 CO2	L1 L2
Q. 1: (F). Differentiate between Mass Production and Mass Customization with one key point each.		

SECTION – B

All questions are compulsory (Each question has an internal choice. Attempt anyone (either A or B) from the internal choice) **6 x 3 = 18 Marks**

<table>
<tr><th>Questions</th><th>CO</th><th>Bloom's Level</th></tr>
<tr><td>Q. 2: (A). A traditional hand-crafted luxury watchmaker (low volume, high variety) is planning to launch a "smartwatch" line aimed at the mass market to compete with global tech giants. Using the Hayes-Wheelwright (Process-Product) Matrix, analyse the current "as-is" position of the watchmaker and the "to-be" position for the new smartwatch line and how must the process characteristics (Flow, Volume, Variety) change to ensure this new venture is cost-competitive?
Or</td><td>CO3</td><td>L3</td></tr>
<tr><td>Q. 2: (B). An international heavy-equipment manufacturer (such as a bulldozer company) is changing its business model from selling machines to providing Equipment-as-a-Service (Power-by-the-Hour). Explain in simple terms how this shift from a product-centric to a service-centric model changes the process design of maintenance and logistics operations. Also, briefly discuss the trade-off between mass customization and sustainability in this situation.</td><td>CO3
CO4</td><td>L3
L3</td></tr>
<tr><td>Q. 3: (A). An automotive component manufacturer currently uses a Process Layout (functional departments for welding, drilling, and painting). However, they are facing high Work-in-Process (WIP) inventory and long throughput times. The management is considering a shift to Group Technology (Cellular Layout) to incorporate Lean Processes. Compare the current Process Layout with the proposed Group Technology layout in terms of three performance measures: Material Handling Cost, Employee Skill Requirement, and Production Flexibility.
Or</td><td>CO4</td><td>L4, L5</td></tr>
<tr><td>Q. 3: (B). A multi-national logistics firm, "Global-Link," is evaluating two potential sites, Site A (Pune) and Site B (Nagpur), for its new regional hub. The operations team has identified six Critical Success Factors (CSFs) and assigned weights to each based on their strategic importance.
The scores for each site (on a scale of 1 to 100, where 100 is excellent) are given below:
<table>
<tr><th>Critical Success Factor (CSF)</th><th>Weight</th><th>Site A (Pune) Score</th><th>Site B (Nagpur) Score</th></tr>
<tr><td>Proximity to main markets</td><td>0.25</td><td>90</td><td>70</td></tr>
<tr><td>Labor availability and skills</td><td>0.2</td><td>80</td><td>60</td></tr>
<tr><td>Operational costs (Tax/Rent)</td><td>0.15</td><td>60</td><td>90</td></tr>
<tr><td>Transport infrastructure</td><td>0.2</td><td>85</td><td>75</td></tr>
<tr><td>Quality of life for staff</td><td>0.1</td><td>70</td><td>50</td></tr>
<tr><td>Government incentives</td><td>0.1</td><td>50</td><td>85</td></tr>
<tr><td>Total Weight</td><td>1</td><td></td><td></td></tr>
</table>
Calculate the Total Weighted Score for both Site A and Site B and recommend the best location based on the result.</td><td>CO5</td><td>L5</td></tr>
<tr><td>Q. 4: (A). A medium-sized manufacturing company producing electrical appliances is experiencing frequent material shortages, excess inventory, and poor coordination between the production and finance departments due to the use of a basic material planning system. As an operations manager, apply the concepts of MRP I and MRP II to explain how each system can help overcome these operational problems. Further, justify which system would be more appropriate for improving material planning, capacity utilization, and overall coordination across departments.
Or</td><td></td><td></td></tr>
<tr><td>Q. 4: (B). A manufacturing firm uses 18,000 units of a raw material annually. The ordering cost per order is ₹300 and the annual holding cost per unit is ₹15. Using the EOQ model, calculate the Economic Order Quantity (EOQ) for the firm. Further,</td><td>CO5</td><td>L5</td></tr>
</table>

determine the number of orders placed per year and compute the total annual ordering cost and total annual holding cost at EOQ.		

SECTION - C

Read the case and answer the questions **5×02 = 10 Marks**

Questions	**CO**	**Bloom's Level**
Q. 5: Case Study: Precision Engineering Ltd. produces high-grade steel pistons for automotive engines. The critical quality dimension is the diameter of the piston, which has a target specification of 50.00 mm. To monitor the stability of the production process, the quality control team takes a sample of 5 pistons every hour. Data for the last 6 samples (subgroups) is provided below. The company uses these samples to establish control limits for the Mean and Range charts.	CO6	L5.L6

Sample No.	**Obs 1**	**Obs 2**	**Obs 3**	**Obs 4**	**Obs 5**	**Mean ($\bar{X}$)**	**Range (R)**
1	50.02	49.98	50.01	50	49.99	50	0.04
2	50.03	50.01	50.02	50	50.04	50.02	0.04
3	49.98	49.97	49.99	49.98	49.98	49.98	0.02
4	50.01	50.02	49.99	50.03	50	50.01	0.04
5	50.05	50.04	50.06	50.05	50.05	50.05	0.02
6	49.99	50	50.01	49.98	50.02	50	0.04

Statistical Constants for n=5, $A_2 = 0.577$, $D_3 = 0$, $D_4 = 2.115$

Questions:

Q. 5: (A). Calculate the Control Limits for Mean and Range charts. Construct Range chart alongside the Mean chart.

Q. 5: (B). Does an "out of control" signal on the mean chart necessarily mean the product is "defective" according to customer specifications? Distinguish between Control Limits and Specification Limits.

Kindly fill the total marks allocated to each CO's in the table below:

COs	**Question No.**	**Marks Allocated**
CO1	1	6
CO2	**1**	**6**
CO3	2	6
CO4	3	6
CO5	4	6
CO6	5	10

(Please ensure the conformity of the CO wise marks allocation as per your TLEP.)

Blooms Taxonomy Levels given below for your ready reference:

L1= Remembering
L2= Understanding
L3= Apply
L4= Analyze
L5= Evaluate
L6= Create